

THE NATIONAL SCIENCE EDUCATION ACTS OF 2000

(To be introduced by Vernon Ehlers and others)

Summary of Prominent Issues and Proposed Actions

I. National Science Education Act

The National Science Education Act (NSEA) is the centerpiece of the National Science Education Acts of 2000 package. NSEA focuses on improving and expanding the activities of the National Science Foundation.

A. Assisting Teachers

Issue: Teachers often work independently in developing lesson plans, seeking out new pedagogical techniques and maintaining the equipment and materials in their classrooms. Due to competing time commitments and limited school resources, teachers frequently are not given adequate support in these activities.

NSEA: Provides grants to public and private schools for the hiring of Master Teachers with strong backgrounds in math, science, and pedagogy. Master Teachers will provide K-8 teachers assistance with professional development and support for the use of hands-on science materials.

Issue: With the rapid introduction of computers and other technology into educational programs, many teachers have not had the opportunity to receive the training they need to make the most effective use of the new tools and materials.

NSEA: Specifies that NSF award grants for teacher professional development in technology use and integration.

Issue: K-12 science, math, engineering and technology teachers often are not considered “scientists,” “mathematicians,” etc. by their subject-matter peers. These teachers also rarely have the opportunity for practical participation in research or for the continuing education that accompanies direct involvement in an area of expertise.

NSEA: Creates a national scholarship to reward teacher participation in science, math, engineering or technology research.

Issue: Some prospective teachers are prevented from pursuing math or science teaching careers because they were not aware of and did not take specified high school courses prerequisite to teacher training college courses.

NSEA: Establishes a mechanism to inform high school students of the high school courses they should complete to prepare for the courses they will need in college for a career as a science, math, engineering or technology teacher.

B. Improving Education for All Students

Issue: School administrators often select educational programs without having the benefit of evaluations or a sufficiently comprehensive awareness of the offerings needed to choose the best possible programs.

NSEA: Creates a working group to identify excellence in content, scope, and sequence in supplemental K-12 science, math, engineering and technology educational programs across the Nation and make that information available to all teachers via the Internet.

Issue: The quest to modernize classrooms has led to technology being used in diverse ways. Some of these uses strengthen current educational practice and some supersede proven methods. There is a lack of consensus regarding the most effective uses of technology in the classroom.

NSEA: Requires a study to evaluate the uses of technology in the classroom.

Issue: Teachers have limited access to information regarding the newest high-quality science, math, engineering and technology educational programs.

NSEA: Increases teachers' access to cutting-edge education programs by requiring NSF-sponsored programs to be posted on the NSF Internet web site.

Issue: Students may not be taught the skills needed to become technologically literate because their teachers also lack a solid technology foundation.

NSEA: Provides access to training for middle school teachers so that all students are technologically literate by the time they enter high school.

Issue: Students in rural schools do not always receive the same learning opportunities, such as access to museums and laboratories, as students in more densely populated areas.

NSEA: Bolsters rural educational opportunities by supporting distance learning components of science, math, technology and engineering grants funded by NSF.

- Issue:** With the rapid inclusion of technology into educational materials, there is a need for more and better educational software. Students themselves should be rewarded for creativity that integrates their newly learned skills.
- NSEA:** Creates a competition for high school and college students to develop educational software.
- Issue:** Students who attend the Nation's poorest schools often have limited opportunities to learn using the most modern Information Technology equipment, and also cannot afford the higher education necessary for many careers in I.T.
- NSEA:** Establishes a pilot program for setting up private sector contributions to and involvement with the information technology programs in the neediest high schools.
- Issue:** Private sector participants in education do not have access to a mechanism that assists them in avoiding duplication, in learning of each others' successes and in cooperating.
- NSEA:** Calls for a NSF conference to link members of the private sector involved in science, math, engineering and technology education.

II. National Science Education Enhancement Act

The National Science Education Enhancement Act (NSEEA) concentrates on improving and expanding the activities of the Department of Education that focus on science, math, engineering and technology education.

A. Assisting Teachers

- Issue:** Novice teachers often are not provided any support in adjusting to a teaching career. Many first, second and third year teachers leave the teaching profession because of this inadequate support. Furthermore, science, math, engineering and technology teachers are more likely to leave the profession because there is a lucrative job market for individuals with expertise in these areas.
- NSEEA:** Provides mentors for novice teachers to reinforce the induction process.
- Issue:** Professional development available to teachers commonly is not comprehensive, long-term, content-based, focused on subject matter and tied to school-year curricula.
- NSEEA:** Authorizes peer-reviewed quality summer professional development institutes.

Issue: Facing the challenge to upgrade technology in every classroom while having limited resources, school administrators often are forced to choose between purchasing hardware and software for students or providing instructional materials and training for teachers. Teachers often find themselves with new educational technology, but without the training necessary to ensure its effectiveness.

NSEEA: Upgrades the capabilities of teachers by providing them needed technology training and instructional materials.

Issue: All teachers have not yet become technologically literate.

NSEEA: College students with expertise in technology can use these skills to train or tutor K-12 teachers in exchange for Work-Study credit.

B. Improving Education for All Students

Issue: Teachers seeking to supplement their science curricula with other materials are faced with a plethora of excellent materials but lack sufficient time or resources to search, evaluate, and choose the appropriate units.

NSEIA: Expands teacher access to quality math, science, engineering and technology programs by enhancing the Eisenhower National Clearinghouse to include program evaluations. The Clearinghouse will also be improved with the addition of a web-based, internal search engine to link each program with sites offering classroom and lecture demonstrations, teachers who have used the program, materials, vendors, curricula and textbooks. Finally, the Clearinghouse will be required to maintain a comprehensive database of all programs.

Issue: Many of the after-school programs funded by the Federal Government do not have an academic component and do not provide children with an opportunity to discover or learn.

NSEIA: Widens children's opportunities to experience science first-hand by creating after-school science day care programs.

III. National Science Education Incentive Act

The National Science Education Incentive Act (NSEIA) concentrates on expanding provisions in the tax code to encourage activities that will benefit science, math, engineering and technology education.

A. Assisting Teachers

Issue: Prospective K-12 science, math, engineering and technology teachers are deterred from entering the teaching profession by the prospect of large school loans and a low salary.

NSEIA: Eases the financial burden for teachers by providing a tax credit of ten percent of their total college tuition, up to \$1,000 per year for 10 years, for K-12 science, math, engineering and technology teachers who graduated from rigorous, content-based preparation programs.

Issue: Science, math, engineering and technology teachers rarely have the opportunity to participate in their fields of scientific or mathematical expertise.

NSEIA: Affords teachers with learning opportunities and practical experience through Externships.

Issue: Many private sector companies hold regular training workshops and classes for their employees, many of which would also be beneficial to teachers.

NSEIA: Augments availability of practical professional development for teachers through access to workforce training by providing a tax credit to private sector companies for including teachers in these trainings.

B. Improving Education for All Students

Issue: Private sector school, technology and laboratory supply businesses have no incentive to make donations of needed equipment to schools.

NSEIA: Spurs private sector contributions of science, math, engineering and technology equipment by providing a tax credit.

Issue: Private sector companies have expertise in workforce training but do not have an incentive to donate their services to K-12 students.

NSEIA: Enlarges students' access to workforce training by providing a tax credit to the private sector for contributing instruction to science and math students in grades K-12.